

IN THE CLAIMS

Please amend the claims as follows:

1. A method of transmitting signals comprising the steps of:  
..... receiving signals to be transmitted;  
..... source encoding said signals to build a variable length  
error code;

5 ..... channel encoding the variable length error code; and  
..... transmitting the channel encoded variable length error  
code.

wherein said step of source encoding said signals to build building  
@ the variable length error code, said method comprising the  
comprises the sub-steps of:

10 (1) initializing the needed parameters : minimum and  
maximum length of codewords  $L_1$  and  $L_{\max}$  respectively, free distance  
 $d_{\text{free}}$  between each codeword (said distance  $d_{\text{free}}$  being for a VLEC  
code C the minimum Hamming distance in the set of all arbitrary  
extended codes), required number of codewords S;

15 (2) generating a fixed length code C of length  $L_1$  and  
minimal distance  $b_{\min}$ , with  $b_{\min} = \min \{b_k; k = 1, 2, \dots, R\}$ ,  $b_k$  =  
the distance associated to the codeword length  $L_k$  of code C and  
defined as the minimum Hamming distance between all codewords of C  
20 with length  $L_k$ , and R = the number of different codeword lengths in  
C, said generating step creating a set W of n-bit long words  
distant of d;

(3) storing in the set W all the possible  $L_1$  - tuples  
distant of  $d_{\min}$  from the codewords of C (said distance  $d_{\min}$  for a  
25 VLEC code C being the minimum value of all the diverging distances  
between all possible couples of different-length codewords of C),  
and, if said set W is not empty, affixing at the end of all words  
one extra bit, said storing step replacing the set W by a new one  
having twice more words than the previous one and the length of  
30 each one of these words being  $L_1 + 1$ ;

(4) deleting all the words of the set W that do not  
satisfy the  $c_{\min}$  distance with all codewords of C, said distance  
 $c_{\min}$  being the minimum converging distance of the code C;

(5) in the case where no word is found or the maximum  
35 number of bits is reached, reducing the constraint of distance for  
finding more words;

(6) controlling that all words of the set W are distant of  
 $b_{\min}$ , the found words being then added to the code C;

(7) if the required number of codewords has not been  
40 reached, repeating the steps (1) to (6) until the method finds  
either no further possibility to continue or the required number of  
codewords;

(8) if the number of codewords of C is greater than S,  
calculating, on the basis of the structure of the VLEC code, the  
45 average length AL obtained by weighting each codeword length with  
the probability of the source, said AL becoming the  $AL_{\min}$  if it is

lower than  $AL_{min}$ , with  $AL_{min}$  = the minimum value of AL, and the corresponding code structure being kept in memory;  
said building method being moreover characterized in that,  
50 considering that all distributions of number of codewords for the best VLEC codes have a similar curve allure of a bell shape type, it is defined an optimal length value  $L_m$  until which the number of codewords increases with their length, whereas it decreases after said value  $L_m$ , said definition allowing to apply the so-called "Ls  
55 optimization" method with avoiding the edges of the curve and to work locally.

2. A method of transmitting signals comprising the steps of:  
..... receiving signals to be transmitted;  
..... source encoding said signals to build a variable length error code;  
5 ..... channel encoding the variable length error code; and  
..... transmitting the channel encoded variable length error code.  
wherein said step of source encoding said signals to build  
10 building a variable length error code, said method comprising the comprises the sub-steps of:  
(1) initializing the needed parameters : minimum and maximum length of codewords  $L_1$  and  $L_{max}$  respectively, free distance  $d_{free}$  between each codeword (said distance  $d_{free}$  being for a VLEC

code C the minimum Hamming distance in the set of all arbitrary  
15 extended codes), required number of codewords S;

(2) generating a fixed length code C of length  $L_1$  and  
minimal distance  $b_{\min}$ , with  $b_{\min} = \min \{b_k; k = 1, 2, \dots, R\}$ ,  $b_k$  =  
the distance associated to the codeword length  $L_k$  of code C and  
defined as the minimum Hamming distance between all codewords of C  
20 with length  $L_k$ , and R = the number of different codeword lengths in  
C, said generating step creating a set W of n-bit long words  
distant of d;

(3) storing in the set W all the possible  $L_1$  - tuples  
distant of  $d_{\min}$  from the codewords of C (said distance  $d_{\min}$  for a  
25 VLEC code C being the minimum value of all the diverging distances  
between all possible couples of different-length codewords of C),  
and, if said set W is not empty, affixing at the end of all words  
one extra bit, said storing step replacing the set W by a new one  
having twice more words than the previous one and the length of  
30 each one of these words being  $L_1 + 1$ ;

(4) deleting all the words of the set W that do not  
satisfy the  $c_{\min}$  distance with all codewords of C, said distance  
 $c_{\min}$  being the minimum converging distance of the code C;

(5) in the case where no word is found or the maximum  
35 number of bits is reached, reducing the constraint of distance for  
finding more words;

(6) controlling that all words of the set W are distant of  
 $b_{\min}$ , the found words being then added to the code C;

(7) if the required number of codewords has not been  
40 reached, repeating the steps (1) to (6) until the method finds  
either no further possibility to continue or the required number of  
codewords;

(8) if the number of codewords of C is greater than S,  
calculating, on the basis of the structure of the VLEC code, the  
45 average length AL obtained by weighting each codeword length with  
the probability of the source, said AL becoming the  $AL_{min}$  if it is  
lower than  $AL_{min}$ , with  $AL_{min}$  = the minimum value of AL, and the  
corresponding code structure being kept in memory;  
said building method being moreover characterized in that the  
50 deletion is realized not only in the last obtained group but also  
in the group of a given length value, in order to go back very  
quickly to smaller lengths, and, considering that all distributions  
of number of codewords for the best VLEC codes have a similar curve  
allure of a bell shape type, it is defined an optimal length value  
55  $L_m$  until which the number of codewords increases with their length,  
whereas it decreases after said value  $L_m$ , said definition allowing  
to apply the so-called "L<sub>s</sub> optimization" method with avoiding the  
edges of the curve and to work locally.

3. A VLEC code building method according to The method of transmitting signals as claimed in claim 1, in which the optimal value for  $L_m$  is  $L_m = L_s + 1$ .

4. A device for carrying out a variable length error code  
buildingtransmitting method according toas claimed in claim 1.